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# MILK CONSUMPTION IN ILLINOIS SCHOOLS 1954-1966

By J. W. Gruebele

University of Illinois / College of Agriculture / Agricultural Experiment Station / Bulletin 732

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# MILK CONSUMPTION IN ILLINOIS SCHOOLS, 1954–1966

By J. W. Gruebele, Assistant Professor of Agricultural Economics

School milk programs have provided an important outlet for fluid milk for the period 1954 through 1966. In 1966, 3.4 billion pounds of milk equivalent was consumed through the National School Lunch Program (NSLP) and the Special Milk Program (SMP) in the United States. This represented almost 3 percent of total civilian disappearance of dairy products. In addition, consumption of milk through the school milk programs has increased dramatically. There was a 259 percent increase in total pounds of milk equivalent consumed in schools from 1954 to 1966 under the federal milk programs. Moreover, the potential milk consumption through these programs far exceeds the quantity of milk that is presently consumed.

In Illinois an estimated 65 million pounds of fluid milk was consumed in public schools in 1966. This represented an increase of almost 10 percent since 1959. However, maximum potential consumption of milk through the school milk programs has not been achieved, least of all in Chicago.

The importance of the school milk programs is further emphasized by the well-known nutritional qualities of milk. Attaining the full potential under these programs may be one of the most effective methods of bringing milk consumption of children nearer to levels prescribed in nutritional standards. For example, in a USDA study, Wolgamot and Fincher suggest that children should consume 3 to 4 half-pints of milk daily per capita.[1] Teenagers should drink 4 half-pints daily to meet increased need for calcium, riboflavin, and other nutrients.[2, 3] Furthermore, other studies have shown that half or more of surveyed children were consuming less than nutritionists recommended.[4, 5, 6]

[1] Wolgamot, Irene H., and Lillian J. Fincher, "Milk and Its Products," *Facts for Consumer Education*, USDA Information Bulletin 125, 1954.

[2] Food and Nutrition Board, *National Research Council Recommended Dietary Allowance*, National Academy of Sciences — National Research Council Publication 302, 1954.

[3] Smith, Janice, "Calcium Needs for Teenage Boys," *Nutrition News* 10 (4): 3, 1947.

[4] Reynolds, M. S., *et al.*, "Dietary Practices of Some Wisconsin School Children," *Journal of Home Economics*, 40:131-2, 1948.

[5] Schwartz, Charles, "A Survey of Nutritional Habits of South Dakota School Children," *Proceedings of the South Dakota Academy of Science*, 27(10):118-179, 1948.

[6] Le Bovit, Corrine, and Faith Clark, "Household Practices in the Use of Milk and Butter," *The Dairy Situation*, Agricultural Marketing Service, USDA, DS-243:15-17, 1954.

# DESCRIPTION OF THE STUDY

The objectives of this study are (1) to show the trend of milk consumption under the two federal school programs in Illinois, (2) to determine the reasons for variation in milk consumption among schools and (3) to evaluate suggestions for increasing school milk consumption in Illinois.

## Source of data

Consumption data and other information were obtained for January, 1966 for each county in Illinois from the county superintendent of schools. This information was used to estimate the number of quarts served pupils in each reported school during the school year. Annual consumption figures were computed on the basis of 180 school days. Benchmark data were available for 1953-54, 1958-59, and 1962.

More detailed information was obtained through personal interviews of principals from 18 public and 3 private schools in Chicago. Information was collected on incomes, condition of housing, condition of school buildings, percent of pupils participating in programs, attitudes of principals, and milk consumption. The milk consumption data were verified from reports received by the State Superintendent of Schools' office.

# TWO TYPES OF FEDERAL PROGRAMS

## National School Lunch Program

One of the first assistance programs for school lunches was begun in 1933. The Reconstruction Finance Corporation provided loans to several communities in Missouri to pay labor costs of preparing and serving school lunches.

In August, 1935, Public Law 320 made it possible for the federal government to assist school lunch programs by donating products. In 1943, the Department of Agriculture announced that federal assistance would be in the form of cash reimbursement.[7]

On June 4, 1946, the National School Lunch Act was passed authorizing federal school lunch assistance in the form of a state grant-in-aid program. The act provided for a continuance of food assistance in the form of cash reimbursement for a portion of the food costs and distri-

[7] USDA, *A Brief History of the National School Lunch Program* (mimeo), Consumer and Marketing Service, revised October, 1965.

bution of suitable foods acquired by the Department of Agriculture in its purchase operations. The law also requires one half-pint of milk with each lunch served.

The National School Lunch Program (NSLP) is currently operated under Public Law 396 and is a grant-in-aid program of federal assistance to the 50 states, the District of Columbia, Puerto Rico, Guam, American Samoa, and the Virgin Islands. Today, some 18 million children in over 71,000 schools are participating in the program.

## Special Milk Program

In 1954, legislation was passed that directed the Department of Agriculture to operate the Special Milk Program (SMP).

In 1965, about 93,000 schools, camps, and child-care institutions participated in this program. Almost 3 billion half-pints were consumed under the program in 1965.[8] Over 32 million children drank milk daily under the NSLP and SMP.

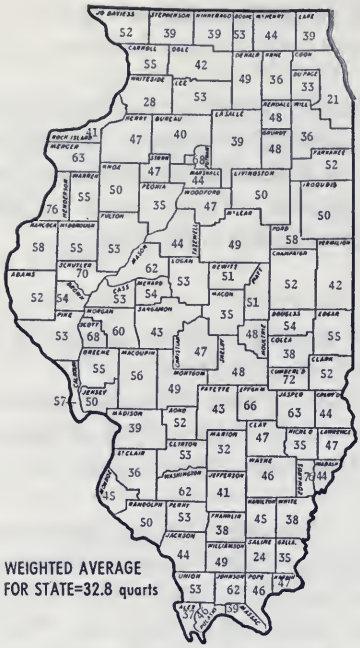
The authorized maximum rate of reimbursement is 4 cents per half-pint for schools participating in both the NSLP and the SMP and 3 cents per half-pint for schools participating only in the SMP. Chocolate as well as regular milk may be served under either program. The lunch program compensates for only one half-pint per pupil per day, but under the SMP there is no limit.

**Table 1. — School Milk Consumption Under the National School Lunch Program and Special Milk Program in the United States, 1954, 1958, 1962, and 1966**

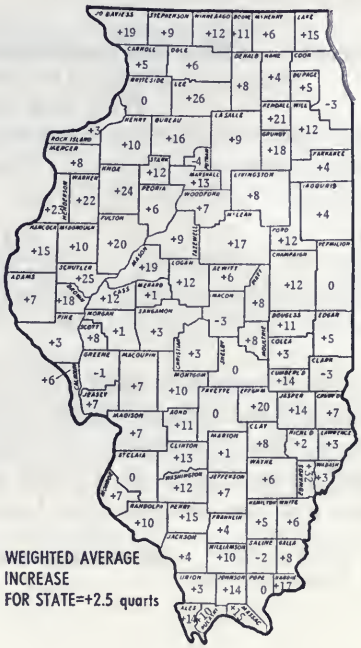
| Year | NSLP | SMP | Total |
|---|---|---|---|
| | | (1,000 pounds) | |
| 1954 | 893,000 | 49,000 | 942,000 |
| 1958 | 1,007,000 | 1,106,000 | 2,153,000 |
| 1962 | 1,305,000 | 1,450,000 | 2,755,000 |
| 1966 | 1,710,000 | 1,670,000 | 3,380,000 |

Milk consumption under the NSLP nearly doubled in the United States between 1954 and 1966 (Table 1). Meantime milk consumption under the SMP expanded to a volume approximately equal to that consumed under the NSLP. In 1966 total consumption under the two programs was equivalent to about 3 percent of total fluid milk consumption.

[8] USDA, *The Special Milk Program* (mimeo), Consumer and Marketing Service, November, 1965.




Average annual milk consumption, quarts per pupil, in Illinois public schools, 1965-66. (Fig. 1)




Increase in milk consumption, quarts annually per pupil, in Illinois public schools, 1958-59 to 1965-66. (Fig. 2)

# CHANGES IN CONSUMPTION OF SCHOOL MILK IN ILLINOIS

## Change in milk consumption by counties

The over-all state average milk consumption in Illinois public schools was 12.3 quarts per pupil in 1953-54. By 1958-59 consumption had increased to 30.3 quarts per pupil annually, and by 1965-66 it had increased to 32.8 quarts per pupil annually. Thus the consumption of milk per pupil in Illinois public schools increased by 163 percent between 1953-54 and 1965-66.

In 1965-66, Henderson and Edwards Counties led all counties in school milk consumption with an average of 76 quarts per pupil (Figure 1). Cook County had the lowest consumption with 21.4 quarts per pupil.

Between 1958-59 and 1965-66, milk consumption increased in 90 counties, remained the same in 6, and decreased in 6 (Figure 2). The weighted average over-all increase in milk consumption during that period was 2.5 quarts annually per pupil. The increase was greatest in Edwards County — 32 quarts per pupil annually.

## Milk consumption in public schools, 1966

The over-all consumption per pupil annually in Illinois for 1965-66 was 32.8 quarts (Table 2). The consumption in public schools was highest in downstate Illinois with 43 quarts per pupil annually. In suburban Cook County the consumption in public schools was 27.9 quarts per pupil annually and for Chicago public schools the consumption was 17.1 quarts per pupil annually.

## Change in milk consumption and level of participation in Chicago, suburban Cook County, and downstate Illinois from 1958-59 to 1965-66

Average consumption per pupil in Chicago public schools declined 3.4 quarts from 1958-59 to 1965-66, a decline of 17 percent. In downstate Illinois during the same period school consumption increased by 7.4 quarts or 21 percent. The consumption per pupil in suburban Cook County was virtually unchanged (Table 3).

In downstate Illinois the proportion of schools participating in both programs increased from 51.3 percent in 1958-59 to 83.8 percent in 1965-66, and in Cook County it increased from 33.3 percent to 46.6 percent during that period. In downstate Illinois the proportion of schools with no programs decreased from 14.2 percent in 1958-59 to 2.7 percent in 1965-66, while in Cook County for the same period it increased from 11.2 percent to 20.1 percent (Table 4).

## Table 2. — Number of Schools, Number of Pupils Enrolled, Total Milk Consumed, and Milk Consumed per Pupil for Illinois Public Schools, 1965-66

| | Number of schools | Enrollment | Number of half-pints daily | Volume per pupil | |
|---|---|---|---|---|---|
| | | | | Half-pints daily | Quarts annually |
| Downstate Illinois schools[a] | | | | | |
| Serving milk | 2,954 | 1,009,738 | 993,211 | .9836 | 44.3 |
| Not serving milk | 83 | 29,777 | | | |
| Total or average | 3,037 | 1,039,515 | 993,211 | .9555 | 43.0 |
| Cook County schools | | | | | |
| Chicago high schools | | | | | |
| Serving milk | 56 | 130,211 | 76,098 | .5844 | 26.3 |
| Not serving milk | 1 | 2,128 | | | |
| Total or average | 57 | 132,339 | 76,098 | .5750 | 25.9 |
| Chicago elementary schools | | | | | |
| Serving milk | 409 | 369,919 | 135,200 | .3655 | 16.4 |
| Not serving milk | 69 | 54,272 | | | |
| Total or average | 478 | 424,191 | 135,200 | .3187 | 14.3 |
| Chicago high and elementary schools | 535 | 556,530 | 211,298 | .3797 | 17.1 |
| Suburban schools | | | | | |
| Serving milk | 462 | 294,036 | 232,737 | .7915 | 35.6 |
| Not serving milk | 163 | 81,350 | | | |
| Total or average | 625 | 375,386 | 232,737 | .6200 | 27.9 |
| All Cook County schools | | | | | |
| Serving milk | 927 | 794,166 | 444,035 | .5591 | 25.2 |
| Not serving milk | 233 | 137,750 | | | |
| Total or average | 1,160 | 931,916 | 444,035 | .4765 | 21.4 |
| All Illinois schools | | | | | |
| Serving milk | 3,881 | 1,803,904 | 1,437,246 | .7967 | 35.9 |
| Not serving milk | 316 | 167,527 | | | |
| Total or average | 4,197 | 1,971,431 | 1,437,246 | .7290 | 32.8 |

[a] Downstate Illinois refers to all counties except Cook County.

Table 3. — Change From 1958-59 to 1965-66 in Milk Consumption per Pupil in Illinois Public Schools

| | Half-pints daily | Quarts annually |
|---|---|---|
| Cook County schools | | |
| Chicago high schools | −.0850 | −3.8 |
| Chicago elementary schools | −.0643 | −2.9 |
| Chicago public schools | −.0762 | −3.4 |
| Suburban public schools | −.0004 | (a) |
| All Cook County public schools | −.0614 | −2.8 |
| Downstate Illinois | | |
| Public schools | +.1636 | +7.4 |
| All schools in Illinois | | |
| Public schools | +.0549 | +2.5 |

[a] Less than 1 quart.

Table 4. — Number and Proportion of Schools Participating in the National School Lunch Program, Special Milk Program, and Both Programs, 1958-59 and 1965-66, in Illinois Public Schools

| | 1958-59 | | 1965-66 | |
|---|---|---|---|---|
| | Number | Percent of total | Number | Percent of total |
| Cook County schools | | | | |
| NSLP only | 9 | 0.8 | 1 | 0.1 |
| SMP only | 632 | 54.8 | 385 | 33.2 |
| Both programs | 384 | 33.3 | 541 | 46.6 |
| No program | 129 | 11.2 | 233 | 20.1 |
| Total | 1,154 | 100.0 | 1,160 | 100.0 |
| Downstate Illinois | | | | |
| NSLP only | 120 | 4.0 | 34 | 1.1 |
| SMP only | 911 | 30.5 | 375 | 12.4 |
| Both programs | 1,530 | 51.3 | 2,545 | 83.8 |
| No program | 425 | 14.2 | 83 | 2.7 |
| Total | 2,986 | 100.0 | 3,037 | 100.0 |
| All schools | | | | |
| NSLP only | 129 | 3.1 | 35 | 0.8 |
| SMP only | 1,543 | 37.3 | 760 | 18.2 |
| Both programs | 1,914 | 46.2 | 3,086 | 73.5 |
| No program | 554 | 13.4 | 316 | 7.5 |
| Total | 4,140 | 100.0 | 4,197 | 100.0 |

Table 5. — Consumption of Milk, Quarts Annually per Pupil, for Private and Public Elementary and Secondary Schools, 1965-66

| | Public schools | | | Private schools | | |
|---|---|---|---|---|---|---|
| | Number of schools | Enrollment | Quarts annually per pupil | Number of schools | Enrollment | Quarts annually per pupil |
| Chicago | | | | | | |
| Elementary schools serving | 409 | 369,919 | 16.4 | 207 | 109,210 | 25.7 |
| Not serving | 69 | 54,272 | .... | 151 | 70,318 | .... |
| Total or average | 478 | 424,191 | 14.3 | 358 | 179,528 | 15.6 |
| High schools serving | 56 | 130,211 | 26.3 | 20 | 16,450 | 38.5 |
| Not serving | 1 | 2,128 | .... | 70 | 52,121 | .... |
| Total or average | 57 | 132,339 | 25.9 | 90 | 68,571 | 9.2 |
| Suburban Cook County | | | | | | |
| Elementary schools serving | 411 | 192,426 | 29.1 | 197 | 94,201 | 28.1 |
| Not serving | 161 | 76,206 | .... | 34 | 17,852 | .... |
| Total or average | 572 | 268,632 | 20.9 | 231 | 122,053 | 23.6 |
| High schools serving | 51 | 101,610 | 47.9 | 9 | 6,620 | 43.0 |
| Not serving | 2 | 5,144 | .... | 27 | 27,021 | .... |
| Total or average | 53 | 106,754 | 45.6 | 36 | 33,641 | 8.4 |
| Downstate Illinois | | | | | | |
| Elementary schools serving | 2,427 | 742,379 | 44.3 | 403 | 121,759 | 36.7 |
| Not serving | 64 | 22,650 | .... | 49 | 11,562 | .... |
| Total or average | 2,491 | 765,029 | 43.0 | 452 | 133,321 | 33.5 |
| High schools serving | 527 | 267,359 | 44.0 | 35 | 17,509 | 45.2 |
| Not serving | 19 | 7,127 | .... | 13 | 7,767 | .... |
| Total or average | 546 | 274,486 | 42.9 | 48 | 25,276 | 31.3 |

### Private and public school milk consumption

Chicago private schools serving milk showed higher milk consumption per pupil than Chicago public schools serving milk (Table 5). Forty-two percent of the private elementary schools in Chicago did not have milk programs, while only 14 percent of the public schools did not have milk programs. At the high school level, 78 percent of the private schools in Chicago and only 2 percent of the public schools did not have milk programs.[9]

In suburban Cook County and downstate Illinois, milk consumption in schools serving milk was higher in public than in private schools. In suburban Cook County, a larger proportion of the public elementary schools than of the private elementary schools had no milk programs.

## FACTORS AFFECTING SCHOOL MILK CONSUMPTION

Previous studies have indicated that there are many factors that affect the consumption of milk in schools. Some of the important factors include price of milk, school size, attitude of the principal and school lunchroom personnel, availability of milk, type of milk served, type of milk program, private school as compared to public school, and secondary school as compared to elementary.

### School size

One of the factors found to be of importance in several studies was that of school size. In an earlier study by Jacobsen[10] and in a North Central Regional study,[11] average milk consumption per pupil was found to be generally less in large schools than in small schools. The present study also indicates an inverse relationship between size and consumption, except for schools with more than 1,750 pupils (Table 6). Most of the schools with enrollments of over 1,750 were high schools and the analysis will later indicate that Chicago high schools had a higher rate of consumption than Chicago elementary schools. Results for downstate Illinois were similar. Statistical tests showed a significant relationship between enrollment and consumption for both Chicago and downstate Illinois.

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[9] Vocational high schools included.

[10] Jacobsen, R. E., *The School Milk Program in Illinois,* University of Illinois Extension Service Circular 831, April, 1961.

[11] Williams, S. W., Quackenbush, G. G., Bartlett, R. W., Baumer, E. R., and Cook, H. L., *Increasing Milk Consumption in Schools,* Michigan State University Agricultural Experiment Station Special Bulletin 403, August, 1955.

Table 6. — Relationship Between Enrollment and Average Consumption per Pupil for Chicago and Downstate Public Schools, 1966

| Enrollment classification | Chicago | | Downstate Illinois | |
|---|---|---|---|---|
| | Number of schools | Quarts annually per pupil | Number of schools | Quarts annually per pupil |
| 0–249 | 25 | 30.9 | 1,516 | 53.0 |
| 250–499 | 59 | 22.1 | 905 | 44.1 |
| 500–749 | 88 | 20.0 | 326 | 40.4 |
| 750–999 | 93 | 16.3 | 102 | 43.1 |
| 1,000–1,249 | 68 | 16.6 | 29 | 40.8 |
| 1,250–1,499 | 47 | 16.2 | 22 | 40.4 |
| 1,500–1,749 | 21 | 13.6 | 14 | 37.0 |
| 1,750–1,999 | 18 | 17.6 | 9 | 36.7 |
| 2,000 and over | 46 | 24.0 | 31 | 40.7 |
| Total or average | 465 | 19.0 | 2,954 | 44.3 |

Table 7. — Average Prices Paid for Milk in Cents per Half-Pint in Public and Private Schools of Various Sizes in Illinois, 1966

| Enrollment classification | Number of schools | Average price per half-pint |
|---|---|---|
| 0–249 | 1,974 | 1.82 |
| 250–499 | 1,374 | 2.09 |
| 500–749 | 660 | 2.38 |
| 750–999 | 316 | 2.65 |
| 1,000–1,249 | 143 | 2.94 |
| 1,250–1,499 | 100 | 2.91 |
| 1,500–1,749 | 48 | 2.84 |
| 1,750–1,999 | 34 | 2.84 |
| 2,000 and over | 103 | 2.71 |
| Total or average | 4,752 | 2.13 |

What are the reasons for the difference in consumption among different sized schools? One possibility is that there may also be an inverse relationship between school size and the proportion of the pupils who stayed in school during the lunch hour. A North Central Regional publication reported such an inverse relationship among schools in Michigan, Ohio, and Wisconsin.[12]

A second reason why consumption in large schools is smaller than in small schools is that large schools tend to charge a higher price (Table 7). It will be shown later that there is a significant relationship between price and consumption.

Other factors that may help to explain the lower consumption in larger schools include: (1) a more impersonal relationship between pupil and principal, (2) less flexibility in scheduling milk service, and

[12] Williams and others, *ibid.*, p. 29.

(3) more competition from soft drinks.[13] Attitude of the principal and school lunch personnel may have a significant influence on the participation in the school lunch and milk programs. As schools become larger, the problems of administering school milk programs can be expected to increase. Consequently, principals in large schools may be reluctant to promote school milk programs. The importance of attitude will be discussed in a later section.

Consumption in Chicago public schools was 17.1 quarts per pupil annually as compared to 43 quarts per pupil annually in downstate Illinois (Table 2). One reason is that the average enrollment is higher in Chicago schools than for downstate Illinois. The average enrollment for public high schools in 1965-66 was 2,326 in Chicago as compared with 507 in downstate Illinois and 1,992 in suburban Cook County. The average enrollment for public elementary schools was 899 in Chicago, 292 downstate, and 464 in suburban Cook County.

## Type of program

The type of program has been found in previous studies to affect the average milk consumption. In general, schools that had both the NSLP and the SMP had higher average milk consumption per pupil than schools with just one of the milk programs. In downstate Illinois, average consumption per pupil was 46.3 quarts annually in schools participating in both programs, while it was 30.4 quarts and 25.3 quarts in schools participating in the SMP only and in the NSLP only, respectively in 1966 (Table 8). There was a similar relationship in Cook County.

Statistical tests showed that there was a significant relationship between the type of milk program and consumption of milk. There was a substantial difference in the proportion of schools participating in both programs as between the public schools in Chicago, suburban Cook County, and downstate Illinois (Table 8). In downstate Illinois 86 percent of the schools serving milk had both programs, in Chicago the proportion was only 64 percent, and in suburban Cook County it was 53 percent. Why is there such a difference? One reason might be that a greater proportion of schools in downstate Illinois are consolidated schools and the distance to school might be so great that it is difficult for children to go home for noon lunch. In Chicago and in suburban Cook County, a larger proportion of children may be able to go home for the noon lunch.[14] Supervisory problems might be still another

[13] Williams and others, *ibid.*, p. 31.

[14] The survey of 18 Chicago public schools indicated that in many of the schools a large proportion of the pupils went home for lunch.

Table 8. — Average Volume of Milk Consumption by Public School Pupils Under the Special Milk Program, National School Lunch Program, or Both Programs, January, 1966

| | Number of schools | Enrollment | Quarts annually per pupil |
|---|---|---|---|
| Chicago | | | |
| SMP only | 166 | 112,141 | 11.4 |
| NSLP only | 1 | 786 | 8.1 |
| Both programs | 298 | 387,203 | 21.2 |
| Suburban Cook County | | | |
| SMP only | 219 | 116,377 | 27.2 |
| NSLP only | ... | ..... | .... |
| Both programs | 243 | 177,659 | 41.2 |
| Totals for Cook County | | | |
| SMP only | 385 | 228,518 | 19.4 |
| NSLP only | 1 | 786 | 8.1 |
| Both programs | 541 | 564,862 | 27.5 |
| Downstate Illinois | | | |
| SMP only | 375 | 114,217 | 30.4 |
| NSLP only | 34 | 9,495 | 25.3 |
| Both programs | 2,545 | 886,026 | 46.3 |
| All schools in Illinois | | | |
| SMP only | 760 | 342,735 | 23.0 |
| NSLP only | 35 | 10,281 | 24.0 |
| Both programs | 3,086 | 1,450,888 | 39.0 |

reason. In the school survey in Chicago, many principals complained about this problem. The larger size of the schools in Cook County may be partly responsible for this because supervisory problems become more difficult as the number of pupils in the school increases.

There were few schools in the northwest areas of Chicago that provided both programs. However, most of them had the SMP. The average family income in this area of the city was higher than in other areas. The attitude of some parents was that they didn't need the school to feed their children. It is possible that similar attitudes might prevail in suburban Cook County.

## Secondary and elementary schools

The average consumption per pupil in all secondary schools with both programs was 40.4 quarts annually as compared with 38.1 quarts in elementary schools (Table 9). The differences between secondary and elementary schools were even larger among schools that had only the SMP.

In Chicago, consumption in secondary schools was higher than in elementary schools, but in downstate Illinois consumption in elementary

Table 9. — Average Milk Consumption in Secondary and Elementary Public Schools, Illinois, 1966

| | Secondary | | Elementary | |
|---|---|---|---|---|
| | Number of schools | Quarts per pupil | Number of schools | Quarts per pupil |
| | | Both programs | | |
| Downstate Illinois | 708 | 43.9 | 1,837 | 47.8 |
| Suburban Cook County schools | 65 | 47.5 | 178 | 34.3 |
| Chicago schools | 57 | 26.0 | 241 | 18.8 |
| All schools in Illinois | 830 | 40.4 | 2,256 | 38.1 |
| | | Special Milk Program only | | |
| Downstate Illinois | 30 | 30.7 | 345 | 29.9 |
| Suburban Cook County schools | 20 | 36.4 | 199 | 24.4 |
| Chicago schools | 0 | .... | 166 | 11.4 |
| All schools in Illinois | 50 | 34.4 | 710 | 21.4 |

schools was larger than for secondary schools. Statistical tests showed these relationships to be significant. The reasons for the opposite relationships in downstate Illinois and Chicago include:

1. Pupils attending secondary schools in Chicago tend to live further from schools than pupils attending elementary schools. Thus, pupils in secondary schools tend to remain at school for noon lunch while a larger proportion of elementary pupils go home for lunch.

2. Many of the rural areas have consolidated school systems, in which case a larger proportion of pupils attending elementary schools would have to remain in school during the noon lunch.

3. It is likely that there is a greater prevalence of pop vending machines in secondary schools than in elementary schools in both Chicago and downstate Illinois.

## Income

One might expect that income and consumption of milk in schools would be positively related. In a study of the SMP and its effects on consumption in St. Louis and Los Angeles schools, it was found that milk consumption in elementary and junior high schools was lowest for the low-income groups before initiation of the SMP. In addition, the greatest consumption increases occurred in the low-income groups after the SMP was initiated.[15]

However, in Chicago schools consumption tended to be lower in high-income than in low-income areas, but the relationship was not sig-

[15] USDA, *The Special Milk Program — Its Effect on Consumption in St. Louis and Los Angeles Schools,* Marketing Research Report No. 209, January, 1958.

Table 10. — Average Milk Consumption for Chicago Public Schools by Average Income in Districts, 1966

| Average income, schools under both programs[a] | Quarts annually per pupil | Average income, schools under both programs[a] | Quarts annually per pupil |
|---|---|---|---|
| $3,984 | 23.4 | $6,766 | 15.9 |
| 4,020 | 22.5 | 7,333 | 20.7 |
| 4,284 | 16.3 | 7,361 | 16.4 |
| 5,138 | 16.1 | 7,385 | 21.1 |
| 5,323 | 18.3 | 7,513 | 18.2 |
| 5,861 | 21.5 | 7,576 | 20.5 |
| 6,156 | 15.1 | 7,638 | 17.4 |
| 6,178 | 19.9 | 7,732 | 14.1 |
| 6,286 | 20.4 | 7,827 | 17.4 |
| 6,408 | 19.4 | 8,370 | 18.5 |
| 6,696 | 22.9 | 8,415 | 9.2 |

[a] 1960 census.

Table 11. — Average Milk Consumption for Chicago Public Schools by Percent Nonwhite Population in Districts, 1966

| Percent nonwhite population | Quarts annually per pupil | Percent nonwhite population | Quarts annually per pupil |
|---|---|---|---|
| 95.3 | 16.3 | 2.5 | 17.4 |
| 80.5 | 22.5 | 2.2 | 20.7 |
| 78.9 | 18.3 | 1.8 | 20.4 |
| 73.4 | 15.1 | 1.3 | 21.5 |
| 68.7 | 16.1 | .8 | 16.4 |
| 54.4 | 23.4 | .6 | 15.9 |
| 22.9 | 18.2 | .4 | 21.1 |
| 17.6 | 19.9 | .3 | 22.9 |
| 6.5 | 14.1 | .1 | 20.5 |
| 6.0 | 19.4 | .1 | 18.5 |
| 3.4 | 17.4 | .1 | 9.2 |

nificant (Table 10). Average consumption per pupil in those areas with an average income of $3,984 was 23.4 quarts annually. In those areas with an average income of $8,415, average consumption was 9.2 quarts annually.

### Percent nonwhite population

The relationship between nonwhite population and consumption levels for Chicago school districts is presented in Table 11. The data do not show a clear relationship between percent nonwhite population and milk consumption per pupil. Statistical tests showed that there was not a significant relationship between milk consumption and percent nonwhite population.

### Relationship between private and public school consumption

The consumption of milk was considerably higher in Chicago private schools than in Chicago public schools in spite of the fact that a larger proportion of public schools provided both programs than did private schools (Table 12). Average consumption for private schools with the SMP exceeded the average consumption in public schools with both programs. Also the consumption for private schools with both programs was much higher than for public schools with both programs. One reason for these differences is that greater individual attention generally is provided in private schools than in public schools. Also,

Table 12. — Average Consumption of Milk in Private Schools as Compared to Public Schools, by Type of Milk Program, 1965-66

| | Public schools | | Private schools | |
|---|---|---|---|---|
| | Number of schools | Quarts annually per pupil | Number of schools | Quarts annually per pupil |
| Chicago | | | | |
| SMP only | 166 | 11.4 | 164 | 23.5 |
| NSLP only | 1 | 8.1 | 7 | 26.1 |
| Both programs | 298 | 21.2 | 56 | 36.1 |
| Total or average | 465 | 19.0 | 227 | 27.4 |
| Suburban Cook County | | | | |
| SMP only | 219 | 27.2 | 186 | 27.4 |
| NSLP only | ... | .... | 1 | 29.7 |
| Both programs | 243 | 41.2 | 19 | 47.8 |
| Total or average | 462 | 35.6 | 206 | 29.1 |
| Downstate Illinois | | | | |
| SMP only | 375 | 30.0 | 247 | 31.4 |
| NSLP only | 34 | 25.3 | 12 | 38.1 |
| Both programs | 2,545 | 46.3 | 179 | 45.6 |
| Total or average | 2,954 | 44.3 | 438 | 37.8 |
| All schools | | | | |
| SMP only | 760 | 23.0 | 597 | 27.3 |
| NSLP only | 35 | 24.0 | 20 | 32.7 |
| Both programs | 3,086 | 39.0 | 254 | 42.3 |
| Total or average | 3,881 | 35.9 | 871 | 31.8 |

pupils attending private schools tend to live farther away from their schools than pupils attending public schools. As a result, it is likely that a larger proportion of the children in private schools participate in the NSLP. For the 18 public schools and 3 private schools surveyed in Chicago, the proportion of children remaining for noon lunch was higher for the private schools than for the public schools.

The difference between private and public school consumption is much smaller in downstate Illinois and in suburban Cook County than it is in Chicago (Table 12). The data show that average milk consumption tended to be higher for public schools than for private schools in downstate Illinois; however, this difference was not statistically significant. But in Chicago, statistical tests showed that consumption of milk in private schools was significantly higher than for public schools.

## Relationship of price to milk consumption

One would expect an inverse relationship between price and average milk consumption. Previous studies have shown that milk consumption decreases as the price charged pupils increases.[16,17]

[16] Williams and others, *op. cit.*, p. 36.

[17] Cook, H. L. and Halvorson, H. W., Pupil Response to Experimental Pricing of Milk, University of Wisconsin Research Bulletin No. 190, January, 1956.

Table 13. — Relationship Between Consumption of Milk and Price Charged for Milk, Illinois Public Schools, 1966

| Pupil price per half-pint | Number of schools | Enrollment | Quarts annually per pupil |
|---|---|---|---|
| All schools except Cook County | | | |
| 0 – .49 | 171 | 31,457 | 59.4 |
| .5– .99 | 17 | 3,252 | 49.8 |
| 1.0–1.49 | 595 | 171,935 | 52.1 |
| 1.5–1.99 | 148 | 57,903 | 49.8 |
| 2.0–2.49 | 1,628 | 589,549 | 43.0 |
| 2.5–2.99 | 183 | 73,949 | 38.9 |
| 3.0 and over | 212 | 81,693 | 31.9 |
| Total or average | 2,954 | 1,009,738 | 44.3 |
| Suburban Cook County | | | |
| 0 – .49 | 15 | 6,078 | 32.8 |
| .5– .99 | ... | ..... | .... |
| 1.0–1.49 | 7 | 3,557 | 25.3 |
| 1.5–1.99 | 34 | 50,330 | 49.0 |
| 2.0–2.49 | 252 | 154,167 | 36.7 |
| 2.5–2.99 | 53 | 21,251 | 28.7 |
| 3.0 and over | 101 | 58,653 | 24.8 |
| Total or average | 462 | 294,036 | 35.6 |
| Chicago (all 3.0 and over) | 465 | 500,130 | 19.0 |
| All schools | | | |
| 0 – .49 | 186 | 37,535 | 55.1 |
| .5– .99 | 17 | 3,252 | 49.8 |
| 1.0–1.49 | 602 | 175,492 | 51.5 |
| 1.5–1.99 | 182 | 108,233 | 49.5 |
| 2.0–2.49 | 1,880 | 743,716 | 41.7 |
| 2.5–2.99 | 236 | 95,200 | 36.6 |
| 3.0 and over | 778 | 640,476 | 21.2 |
| Total or average | 3,881 | 1,803,904 | 35.9 |

The data obtained in the study also show that average consumption decreased as price increased (Table 13). This was found to be statistically significant. This relationship provides a second reason for the smaller milk consumption in Chicago schools than for downstate Illinois. The average price paid by pupils for milk in Chicago is 3 cents per half-pint for white milk and 4 cents for chocolate; in suburban Cook County, 2.21 cents for both; and in downstate Illinois, 1.86 cents for both.

Consumption of milk in Chicago schools declined from 20.5 quarts per pupil in 1958-59 to 17.1 quarts in 1965-66. One reason for this decline is that the price of milk increased 33 percent between 1958-59 and 1965-66. In 1959, the price of milk to pupils in Chicago was 2 cents per half-pint for white milk and 3 cents for chocolate.

Table 14. — Comparison of School Milk Consumption for Schools Serving Both Chocolate and White Milk as Compared to Schools Serving White Milk Only, 1966

| | Number of schools | Enrollment | Quarts annually per pupil |
|---|---|---|---|
| | Schools serving chocolate and white milk | | |
| Chicago schools | 565 | 563,299 | 20.3 |
| Suburban Cook County schools | 253 | 172,748 | 39.5 |
| All counties except Cook County | 2,363 | 756,383 | 46.5 |
| All schools in Illinois | 3,181 | 1,492,430 | 35.8 |
| | Schools serving white milk only | | |
| Chicago schools | 127 | 62,491 | 23.6 |
| Suburban Cook County schools | 415 | 222,109 | 29.6 |
| All counties except Cook County | 1,029 | 392,623 | 37.7 |
| All schools in Illinois | 1,550 | 677,223 | 33.8 |

## Availability of chocolate milk

One would expect that school milk consumption would be greater if both chocolate and white milk were available than if white milk only is available. A Wisconsin study[18] indicated that, from the results of their experiment, combined sale of chocolate and white milk probably enhances consumption. It is reasonable to expect higher consumption when both flavors are available because some pupils will be more likely to take milk if chocolate is available, too.

The consumption of milk in downstate Illinois was 46.5 quarts per pupil annually in schools serving chocolate and white and 37.7 for schools serving white only (Table 14). Similar results were shown for suburban Cook County. But in Chicago, the average consumption for schools serving both flavors was smaller than for schools serving white milk only. There is no apparent reason for this result. Statistical tests showed that in cases where chocolate milk was served, the consumption was significantly higher in downstate Illinois. There was no significant difference for Chicago schools.

## Regression analysis

The purpose of this section of the bulletin is to determine which measurable factors are associated with variations in school milk consumption. The economic model appropriate for this analysis is:

[18] Cook, H. L. and Halvorson, H. W., *op. cit.*, p. 2.

$$Qd = f\ (Pm, I, T, S, NW, C, K, H, P)$$

where Qd is quantity of milk, Pm is price of milk, I is income, T is tastes and preferences, S is size of school, NW is percent nonwhite population, C is availability of chocolate milk, K is kind of milk program, H is secondary schools, and P is private schools.

The following statistical model was utilized to ascertain which factors were associated with variation in school milk consumption:

$$Y_1 = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + u$$

where Y is the consumption of milk in quarts annually per pupil, a is the intercept, $X_1$ is private schools, $X_2$ is secondary schools, $X_3$ is size of school, $X_4$ is price of milk to pupils per half pint, $X_5$ is average family income, $X_6$ is percent nonwhite population, $X_7$ is schools with both programs, $X_8$ is schools with lunch only, and $X_9$ is schools serving chocolate and white milk. Variables $X_1$, $X_2$, $X_7$, $X_8$, and $X_9$ are dummy variables; because each had only two categories, values of 0 or 1 were assigned. For example, for variable $X_1$, if the school was a private school then variable $X_1$ was assigned a value of 1; if it was a public school, variable $X_1$ was assigned a value of 0.

In this model it was assumed that the relationship between consumption and the independent variables of enrollment, cost, income, and percent nonwhite population was not affected by the zero-one variables. Additional assumptions include the ones usually made in multiple regression analyses.

Separate regression analyses were made for Chicago and downstate Illinois. The number of schools included were 691 in Chicago and 3,392 in downstate Illinois. The results indicate that all of the regression coefficients except income, percent nonwhite population, and chocolate milk were significant at the 95 percent confidence level in Chicago.[19] In downstate Illinois only the regression coefficients of private versus public and of income were not significant.

How are these regression coefficients interpreted? The regression coefficient for milk price was −6.24 in Chicago schools (Table 15), which means that as the price of milk increased by 1 cent per half-pint the consumption of milk decreased by 6.24 quarts per pupil annually, holding constant all other variables included in the analysis.

[19] Significance at the 95 percent level means that any regression coefficient divided by its standard error $\geqq 1.96$ is significantly different from 0 at the 95 percent confidence level. This means that in only 5 out of 100 cases would you find a computed value greater than 1.96, due to chance alone.

Table 15. — Regression Coefficient for Variables Affecting Milk Consumption in Schools for Chicago and Downstate Illinois

| Independent variables | Regression coefficient | | b/Sb† | |
|---|---|---|---|---|
| | Chicago | Downstate | Chicago | Downstate |
| | (Quarts) | | | |
| Secondary | 13.108 | − 2.27 | 7.33* | − 2.68* |
| Private | 9.058 | 1.31 | 6.09* | 1.18 |
| Enrollment | − .0068 | − .008 | −8.19* | − 8.29* |
| Price | − 6.244 | − 6.64 | −7.49* | −12.82* |
| Income | − .0011 | − .0007 | −1.76 | − .93 |
| Percent nonwhite population | − .0334 | − .187 | −1.41 | − 2.18* |
| Both programs | 9.38 | 12.53 | 8.06* | 11.87* |
| Lunch | −13.35 | −10.10 | −2.73* | − 3.11* |
| Chocolate | 2.23 | 6.22 | 1.29 | 7.73* |

† b represents the regression coefficient Sb represents its standard error.
* Significant at the 95 percent confidence level.

## RESULTS OF THE SCHOOL SURVEY

To find other factors that might help to explain variation in school milk consumption, eighteen public schools and three private schools were interviewed.

None of the schools interviewed had milk vending machines. All public schools charged 3 cents for white milk and 4 cents for chocolate. All of the schools charged the same price for the second carton of milk as for the first carton; all were satisfied with the services provided by milk dealers; all offered a course in nutrition; and all were satisfied with the promotional work carried out by the Dairy Council or Milk Foundation.

Of the 18 public schools interviewed, three had average annual milk consumption of less than 10 quarts per pupil, four averaged from 10 to 15 quarts annually, six averaged from 15 to 25 quarts annually, and five averaged over 25 quarts annually per pupil. Milk consumption in all three of the private schools exceeded 25 quarts per pupil annually.

The relationships between various factors and milk consumption were similar to the results discussed earlier (Table 16). For the public schools there appeared to be an inverse relationship between enrollment and consumption; there was no apparent relationship between income and consumption. In general schools participating in both programs had higher levels of milk consumption.

### Differences between high consumption and low consumption schools

One characteristic of schools with high consumption is that they have both the SMP and the NSLP. All schools in the survey with con-

Table 16. — Characteristics of Schools Interviewed in Chicago by Levels of Milk Consumption

| School | Consumption (quarts annually per pupil) | Enrollment | Average income[a] | Participation in lunch program | Attitude of principal | Percent nonwhite pupils |
|---|---|---|---|---|---|---|
| | | | Milk consumption of less than 10 quarts per pupil | | | |
| 1 | 1 | 1,139 | 7,513 | n.a.[b] | Poor | .5 |
| 2 | 3.6 | 850 | 8,370 | n.a. | Excellent | .1 |
| 3 | 6.3 | 1,097 | 5,138 | 10* | Indifferent | 68.7 |
| | | | Milk consumption of 10–15 quarts per pupil | | | |
| 4 | 11.7 | 570 | 8,370 | n.a. | Excellent | .1 |
| 5 | 14.0 | 625 | 3,984 | 10* | Good | 99.0 |
| 6 | 14.4 | 1,509 | 4,020 | n.a.* | Indifferent | 100.0 |
| 7 | 14.8 | 1,020 | 4,284 | 10* | Good | 100.0 |
| | | | Milk consumption of 15–25 quarts per pupil | | | |
| 8 | 15.3 | 1,340 | 7,513 | 25* | Indifferent | 100.0 |
| 9 | 16.2 | 1,061 | 4,284 | n.a.* | Very Poor | 20.0 |
| 10 | 16.2 | 1,283 | 4,284 | 20* | Very Good | 13.0 |
| 11 | 16.6 | 1,174 | 4,020 | 15* | Excellent | 100.0 |
| 12 | 17.1 | 1,111 | 4,284 | 15* | Very Poor | 95.3 |
| 13 | 23.0 | 834 | 3,984 | 20* | Excellent | 54.4 |
| | | | Milk consumption of over 25 quarts per pupil | | | |
| | | | Elementary | | | |
| 14 | 26.1 | 554 | 6,286 | 15–20* | Excellent | 50.0 |
| 15 | 30.6 | 948 | 4,284 | 10* | Excellent | 100.0 |
| 16 | 45.0 | 413 | 4,040 | 30* | Excellent | 50.0 |
| | | | High schools | | | |
| 17 | 27.0 | 5,404 | 5,138 | 90–95* | Good | 75.0 |
| 18 | 27.9[c] | 2,477 | 8,415 | 50* | Very Good | 70.0 |
| | | | Private schools | | | |
| 19 | 33.5 | 480 | 3,984 | 80 | Excellent | 50.0 |
| 20 | 45.0 | 154 | 6,696 | 100 | Excellent | 100.0 |
| 21 | 168.0 | 300 | 7,361 | 100* | Excellent | 25.0 |

* Participate in both programs.
[a] Represents family income, 1960 census (by district).
[b] Not available.
[c] Less than 1 percent.

sumption of over 15 quarts per pupil annually participated in both programs (Table 16).

The public schools in the survey that did not participate in the NSLP were located in the higher income areas.[20] In two of these schools, the principals indicated that mothers felt too proud to have the school provide milk or lunch for their children and that the children's nutritional needs were being adequately met in the home.[21] Two of the private schools did not have the SMP; milk consumption for these schools was lower than for the private school that had both programs.

A second characteristic of schools with high milk consumption is that participation in the school lunch program is high. For example, 90-95 percent of the pupils in one of the high schools participated in the lunch program. In the second high school, 50 percent of the pupils participated in the lunch program, but a large percentage carried lunches and purchased milk. The average consumption in these high schools was 27.0 and 27.9 quarts annually per pupil, well above the average for the surveyed public schools. In addition, private school pupil participation in the NSLP ranged from 80 to 100 percent. The average consumption for the three private schools was greater than that for the public schools interviewed. Contrariwise, those schools with an average consumption of less than 15 quarts per pupil annually had 10 percent or less of their pupils participating in the NSLP. Two schools showed rather large percentages for pupils carrying their own lunch; however, neither of these schools had a NSLP.

A third and probably one of the most important factors was the attitude toward the milk programs by the principals of the schools. All those schools with an average consumption of more than 20 quarts per pupil annually had good to excellent attitudes toward the milk programs. For example, one of the public school principals indicated he would like to double the participation in the school lunch program but that facilities were limited. He believed that children must be well fed to be receptive. He stated that by midafternoon some children became quite restless because they had eaten inadequate lunches. On the other hand, among schools offering both programs, it was found that in those where the consumption of milk was low, the attitude of the principals also tended to be somewhat indifferent.

A fourth factor affecting the amount of milk consumed is whether the school is a private school or a public school. Consumption in the

[20] Family income of over $7,500 per year.

[21] One principal indicated that parents view the milk programs as "government hand-outs" and therefore do not want to be associated with the programs.

private school with both programs was 168 quarts per pupil annually. Consumption in the two other private schools was somewhat lower because neither had the SMP, but milk consumption in these schools was still significantly higher than for most of the public schools included in the survey. One of the apparent reasons for higher milk consumption in private schools is that more personal attention is given to pupils and their nutritional needs in those schools than in public schools. Parents expect more personal attention for their children because they generally have to pay tuition. In the school where milk consumption was 168 quarts per pupil annually, the principal indicated that the pupils are required to remain in school during the noon hour. Attention to the pupils was emphasized in another way in the school where the average consumption of milk was 33.5 quarts per pupil annually. This particular school was a Catholic elementary school with an enrollment of 480 pupils. If the children were unable to pay for their lunches, the cost was paid by a special fund donated by the nuns in the school. Another reason for higher milk consumption in private schools is that children attending such schools tend to live farther away than children attending public schools.

## RECOMMENDATIONS

The foregoing description and analysis suggests several ways by which consumption might be increased. These and several additional ways will be discussed in this section:

- Initiate milk programs in schools without federal milk programs
- Reduce the price of milk
- Increase container size
- Use vending machines
- Unite the effort between welfare organizations and school officials
- Introduce new products
- Provide adequate funds

### Initiate milk programs in schools

A substantial number of schools in Illinois still do not serve milk. Three percent of the public schools in downstate Illinois, 13 percent of the public schools in Chicago, and 26 percent of the public schools in suburban Cook County do not participate in either the NSLP or the SMP. Among private schools 12 percent in downstate Illinois, 49 percent in Chicago, and 23 percent in suburban Cook County did not participate in either the NSLP or the SMP. Assuming average milk con-

sumption, the total milk consumption in Chicago could increase by 4,165,667 quarts on an annual basis if all schools served milk. If all schools served milk, annual consumption in suburban Cook County would increase by 4,576,928 quarts and in downstate Illinois by 2,100,823 quarts. For the entire state, consumption would increase by 15 percent if all schools not now serving milk would initiate milk programs, assuming average consumption.

Also, not all schools serving milk participate in both the NSLP and the SMP. For the state as a whole, 18 percent of the schools participate in just the SMP and 0.84 percent participate just in the NSLP.

### Reduce the price of milk

This and other studies have shown that price and school milk consumption are inversely related. Thus one way to increase school milk consumption is to reduce the price charged. Milk consumption in Chicago schools might be increased significantly if it were possible to reduce the price charged pupils for milk. Annual milk consumption in Chicago public schools has averaged only 17.1 quarts per pupil as compared to 43 quarts per pupil in downstate Illinois.

### Increase container size

One of the possible ways of reducing the milk price to pupils is to increase the container size from one-half pint to one-third quart without increasing the charge per serving. In 1954, the one-third quart container was introduced in a number of schools in suburban Cook County and two schools in Chicago.[22] The price charged for milk was not increased even though the container size was increased. By the end of a three-month period, consumption of milk in one high school increased 46 percent, in a suburban high school 50 percent, and in some other schools by 30 to 40 percent.[23]

These increases in consumption resulted from both the increase in the size of container and the decrease in the price of milk on a half-pint equivalent basis. An increase in consumption would be expected even if the price of milk was not reduced. Presumably, a child who normally consumes a half-pint of milk with his noon lunch would now consume a third-quart of milk. The child would be consuming 33 percent more milk with his lunch under the one-third quart program than under the one-half pint program.

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[22] Mees, Carl Fred, *The Historical Development of the Cooperative Agricultural Extension Service in Cook County, Illinois,* unpublished Ph.D. thesis, University of Chicago, pp. 189-192, December, 1959.

[23] *Ibid.*

The question arises whether the higher milk consumption would be maintained over a period of several years. Consumption in schools serving one-third quart containers was compared to that in schools serving one-half pint containers in suburban Cook County. The results indicate that the average consumption in the 10 schools serving one-third quarts was 44.1 quarts per pupil annually as compared to 34.1 quarts for the remaining schools in suburban Cook County, or 29 percent higher for schools serving milk in one-third quart containers. The consumption for schools serving milk in the entire state averaged 35.9.

## Use vending machines

Vending machines have been utilized to increase milk consumption. Milk vending machines are especially adaptable to large schools because a certain volume is required to break even. One advantage of vending machines is that cold milk is readily accessible to pupils throughout the day.

In a West Virginia study, automatic and semi-automatic vending machines were installed in five schools in 1956.[24] The price charged for homogenized milk was 3 cents per half-pint in most schools. The difference between the pupil payment and the wholesale price was paid to schools through the SMP. The total sales in the five schools increased 26 percent after the vending machines were installed, while school attendance increased only 7 percent. Similar results were obtained in other studies. [25, 26]

## Unite the effort

Another method that might be used to increase school milk consumption would be to have welfare organizations and school officials unite their efforts to improve the diet of children from poverty-stricken families. This could be accomplished by taking a portion of the welfare check and paying it to the school to provide meals for the child through a school lunch program. For 29 cents a well-balanced meal could be provided for the underprivileged children. The principals who were surveyed indicated that many of the children from families supported by welfare spend their lunch money for snacks of low food value.

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[24] Clarke, James H., Meyers, M., and Hunter, J. Scott, *A Marketwide Evaluation in Berkeley County,* West Virginia Agricultural Experiment Station Bulletin No. 429, June, 1959.

[25] Brown, E. Evan, *Selling Milk by Automatic Vending Machines,* South Carolina Agricultural Experiment Station Bulletin No. 435, June, 1956.

[26] Sykes, J. G., *Milk Vending in Vermont,* Vermont Agricultural Extension Station Bulletin No. 592, June, 1956.

### Introduce new products

Previous studies have shown that milk consumption was directly related to new products.[27] In the present study, consumption in schools serving chocolate milk in downstate Illinois was significantly higher than in schools serving white milk only. The availability of flavors other than chocolate might also increase consumption of milk.

Participation in the NSLP could also be improved by providing for more variation in the menu. Several principals indicated that participation in this program would be enhanced if hot dogs, hamburgers, and french fries were made available on occasion.

### Provide adequate finances

One special problem schools have faced is that federally appropriated funds have often been depleted before the end of the fiscal year. In such cases the schools have to finance the lunch or milk program. One source of funds to carry the schools through such periods is the one cent per half-pint profit margin under the SMP that schools may make to meet various expenses associated with the school lunch or milk programs. During the fiscal year 1966-67, the reimbursement rate in the SMP was cut by 10 percent in Cook County from September, 1966 through January, 1967 because of the expectation that federally appropriated funds would not be sufficient to reimburse schools at the full rate for the entire year.

For the fiscal year 1966-67, schools participating in the NSLP were not reimbursed for May and June, and in April they received one-half their normal reimbursement. If the schools' accumulated distribution funds were inadequate, then they had to appropriate funds elsewhere. This has discouraged some schools from continuing the milk programs in their schools.

One aspect of the milk programs that has discouraged pupil participation has been that many times refunds have not been made to pupils who were absent due to illness or for other reasons.

From a welfare standpoint, in Chicago especially, an increase in the consumption of milk would improve the welfare of many children without reducing the welfare of others materially. The annual consumption per pupil in public schools in downstate Illinois was 44 quarts. If Chicago school consumption could be increased to this level, the total volume of milk consumption would increase from approximately 12,900,000 quarts to 27,540,000 quarts annually, an increase of 14,640,000 quarts or 113 percent.

[27] Sykes, J. G., *ibid.*, pp. 1-12.

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